

Deterioration Models

The following deterioration models have been implemented within dTIMS CT. The Table 2 outlines the performance curve equations that have been implemented within dTIMS CT for analysis and the table is followed by a series of figures (Figure 1 and Figure 2) outlining the deterioration curves in graphical format.

Deterioration Model Name	Description	Expression
ancCND_STR_CULVERT	Calculate Culvert Condition	IF (STRUCTURES->CULVRATING < 0.0, 0.0, 9.0 – 13.59140915* EXP(-(60.0/nAAV_AGE_CULVERT) * * 1.942))
ancCND_STR_DECK	Structure Deck Alpine	MIN (9.0, 9.0-13.59140915* EXP(-(45.0/nAAV_AGE_DECK) * * 1.153)))
ancCND_STR_SUBSTRUCTURE	Substructure	IF (STRUCTURE->MAINSPANS <= 1.0, 9.0 – 13.59140915* EXP (-(75.0/nAAV_AGE_SUB) * * 2.462)), 9.0 – 13.59140915*EXP (-(75.0/nAAV_AGE_SUB) * * 1.742)))
ancCND_STR_SUFF_RATE	Structure Sufficiency Rating	100.0 – 135.9140915*EXP(-(75.0/nAAV_AGE_SUFF) * * 1.4514))
ancCND_STR_SUP_CNT_COMPLX	Superstructure Condition for Prestressed Continuous Concrete - Complex	9.0 – 13.59140915*EXP(-(75.0/nAAV_AGE_SUP) ** 2.462))
ancCND_STR_SUP_CNT_SIMPLE	Superstructure Condition for Prestressed Continuous Concrete - Simple	9.0 – 13.59140915*EXP(-(75.0/nAAV_AGE_SUP) ** 2.893))
ancCND_STR_SUP_CONCRETE	Superstructure Condition for Concrete	9.0 – 13.59140915*EXP(-(75.0/nAAV_AGE_SUP) ** 2.893))
ancCND_STR_SUP_STEEL	Superstructure Condition for Steel	9.0 – 13.59140915*EXP(-(75.0/nAAV_AGE_SUP) ** 3.527))
ancCND_STR_SUP_TIMBER	Superstructure Condition for Timber	9.0 – 13.59140915*EXP(-(75.0/nAAV_AGE_SUP) ** 1.984))

Table 1: Deterioration Models

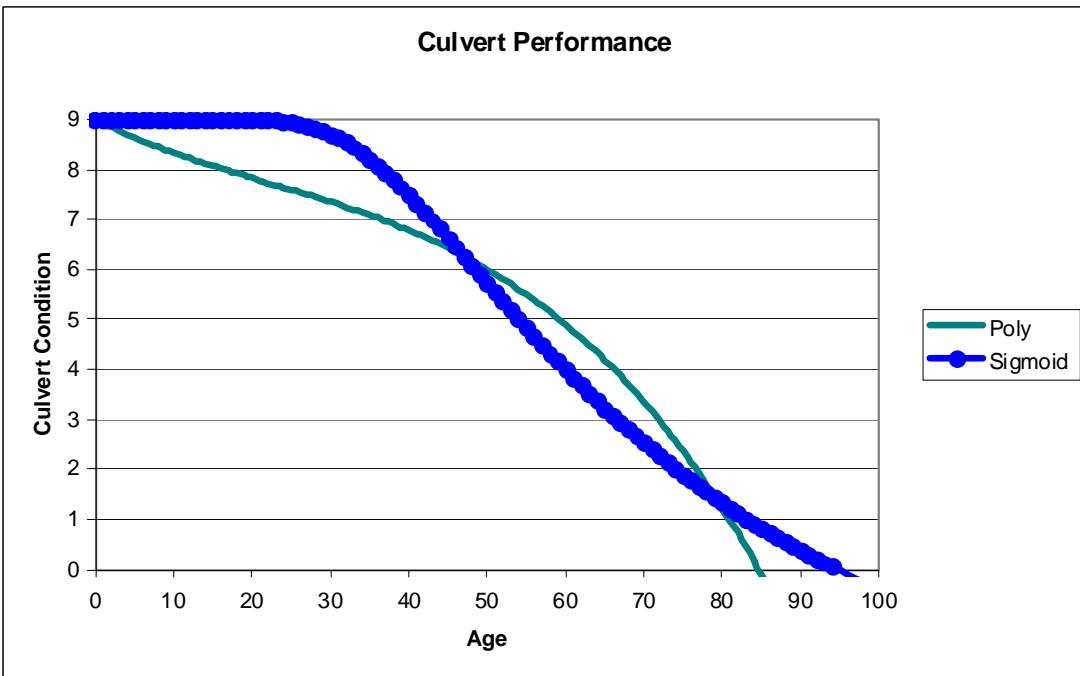


Figure 1: Culvert Deterioration Models

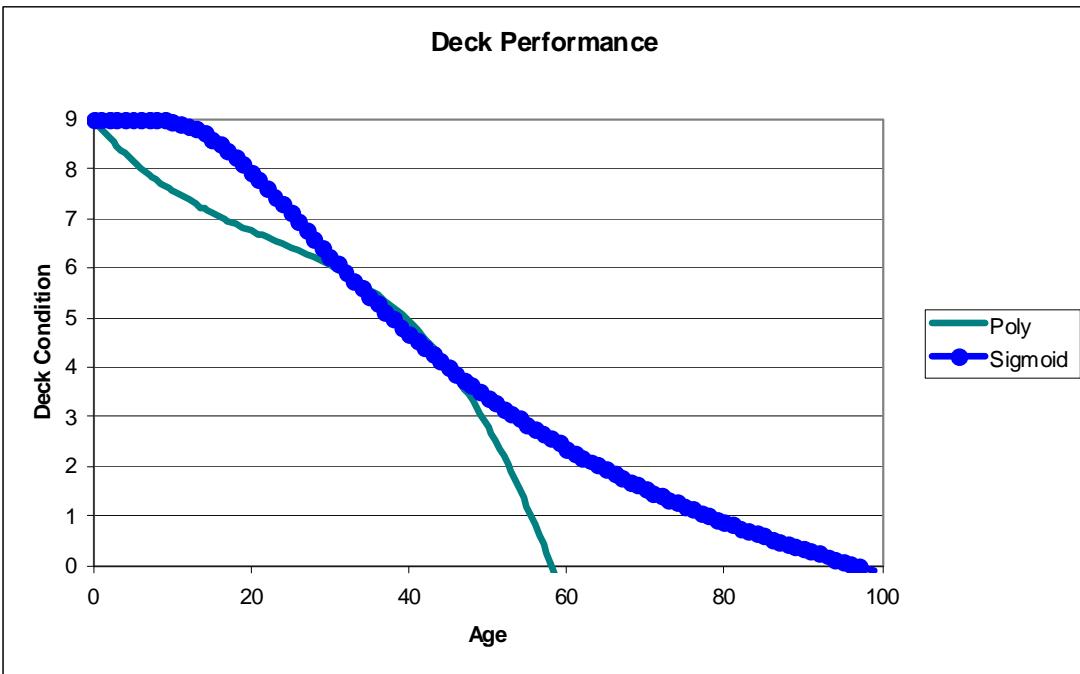


Figure 2: Deck, Sub, and Superstructure Deterioration Models

A sigmoid or traditional “S” shaped curve allows for a time of little or no deterioration at the start of the assets life and then two additional periods of deterioration through a specified failure point.